Remarks

Claims 1, 3-5, 8, 9, 11-23, 26-38, 40, 41, 44-50, 52-60, 62, 64, and 66-68 remain pending and stand rejected. Claims 1, 3, 8, 9, 11, 14, 33, 35, 41, 45, 57, 64, 67 and 68 are currently amended. The Assignee respectfully requests allowance of claims 1, 3-5, 8, 9, 11-23, 26-38, 40, 41, 44-50, 52-60, 62, 64, and 66-68.

Claim Amendments

Independent claims 1, 8, 11, 14, 35, 41, 45, 57, 64, 67, and 68 are amended to indicate that the stabilized oscillator signal is "a *continuously* stabilized oscillator signal *comprising a frequency that does not drift*." Support for the amendments is provided in the current application at page 15, line 20, to page 16, line 6. Dependent claims 3, 9 and 33 are amended in accordance with the amendments to the independent claims.

Introductory Response to Arguments Presented in the Advisory Action

In its "Response to Arguments," the advisory action asserts that arguments made on behalf of the Assignees describing the difference between a *stabilized* oscillator signal, and a signal that is *resynchronized*, *corrected*, or *recalibrated*., are of no moment, as U.S. Patent No. 6,163,294 to Talbot (hereinafter "Talbot") employs the term "stabilized" to refer to an oscillator that is periodically resynchronized or corrected by way of a one pulse-per-second (PPS) signal from a GPS receiver. (Pages 2 and 3 of the advisory action; and column 5, line 64, to column 6, line 9, of Talbot.) Also, the advisory action indicates that since the claims do not further define this characteristic of the stabilized oscillator signal, the claims read upon the cited systems which perform periodic resynchronization or correction of signals experiencing frequency drift. (Pages 2 and 3 of the advisory action.) As a result, the rejections set forth in the final Office action of January 20, 2006 (hereinafter, "the final Office action") stand.

In response, independent claims 1, 8, 11, 14, 35, 41, 45, 57, 64, 67, and 68 are amended to indicate that the stabilized local oscillator is "a *continuously* stabilized oscillator signal *comprising a frequency that does not drift*." Thus, the continuously stabilized oscillator signal does not experience drift requiring periodic resynchronization, correction, or recalibration, as described in previous responses. As a result, none of the cited references teach or suggest the

independent claims as amended, including the continuously stabilized local oscillator therein, as discussed in greater detail below.

Request to Address Each Point Raised in this Response

Also, in addition to the arguments mentioned above regarding the scope of a stabilized oscillator signal, the response of March 14, 2006, to the final Office action sets forth other reasons in support of patentability, many of which were not addressed in the advisory action. Therefore, the Assignee respectfully requests that each argument provided herein countering each current ground of rejection maintained in the future be addressed in subsequent Office actions.

Claim Rejections Under 35 U.S.C. § 103

Presented in the final Office action are numerous rejections, each of which is listed and addressed in order below. The claims covered by each rejection are also corrected below to reflect previously canceled claims.

Independent system claims 1 and 8 include a stabilizing system, comprising "a timing source configured to generate a stable timing signal, wherein the stable timing signal comprises a global positioning system based timing signal; and a *stabilized local oscillator* configured to receive the stable timing signal and to *use the stable timing signal as an input to generate a continuously stabilized oscillator signal comprising a frequency that does not drift*...." (Emphasis supplied.) Independent system claim 11 incorporates a similarly configured stabilized local oscillator at the upper portion of a tower. Independent system claims 14, 35 and 41 include a timing source and stabilized local oscillator as provided for in claims 1 and 8.

Similarly, independent method claim 45 provides for "generating a stable timing signal, wherein the stable timing signal comprises a global positioning system based timing signal; and using the stable timing signal as an input to a local oscillator to *generate a continuously stabilized oscillator signal comprising a frequency that does not drift*...." (Emphasis supplied.) Independent method claims 57, 64, 67 and 68 provide similar limitations.

The Assignee respectfully traverses the rejections, as discussed in detail below, as they pertain to these particular limitations of the independent claims.

Claim Rejections Based Upon a Combination of Georges and Rudow

Claims 8-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,014,546 to Georges et al. (hereinafter "Georges") in view of U.S. Patent No. 5,689,431 to Rudow et al. (hereinafter "Rudow"). (Page 4 of the final Office action.)

Claims 1, 3-5, 14, 16-21, 23, 28, 31, 35-38, 40, 45, 48, 49, 54 and 56-60 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Georges in view of Rudow and U.S. Patent No. 5,936,754 to Ariyavisitakul et al. (hereinafter "Ariyavisitakul"). (Page 6 of the final Office action.)

Claims 30, 32, 41, 44, 55, 64 and 66 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Georges in view of Rudow, Ariyavisitakul, and U.S. Patent No. 6,865,169 to Quayle et al. (hereinafter "Quayle"). (Page 7 of the final Office action.)

Regarding claims 8 and 9, the final Office action indicates that "Georges fails to disclose the 'stable' timing signal comprises a GPS based timing signal. However, Rudow discloses a system wherein *a base station uses the GPS 'stable' timing signal to recalibrate clock (or timing signal) errors of the oscillators* caused by temperature drift, for improving stability of the oscillators in order to obtain a good synchronization (see Fig. 1, col. 6, lines 53-56, col. 7, lines 30-35, col. 9, lines 35-37, col. 14, lines 31-48 and col. 35, lines 57-63). Therefore, it would have been obvious…to incorporate the above teaching of Rudow to Georges for utilizing a GPS based timing signal to recalibrate clock (or timing signal) errors of the oscillators as well, for improving the stability of the oscillators caused by temperature drift or aging components." (Page 5 of the final Office action; emphasis supplied.) The Assignee respectfully disagrees, as the GPS-based signal of Rudow cannot be combined with the system of Georges, no motivation exists to combine the references, and less than all of the limitations of claims 8 and 9 are provided by Georges and Rudow.

Georges discloses a "system for transmitting a WLL [Wireless Local Loop] radio frequency (RF) signal in a RF bandwidth over a low bandwidth medium which has a transmission bandwidth below the RF bandwidth." (Column 4, lines 43-45.) As shown in Fig. 4, the system 50 employs a first local oscillator 58 driving an input of a mixer 56. (Column 7, lines 14-16.) The other input of the mixer 56 is driven by an RF signal 12. (Column 7, lines 8-11.) The local oscillator 58 is coupled with a global reference oscillator 66 in a phase-locked loop 92 to deliver an RF reference tone 96 of high stability to the mixer 56 to down-convert the

RF signal 12. (Column 8, lines 37-43.) To perform this down-conversion within the Georges system, "[i]t is intended that unstable IF reference tone 100 [of Fig. 5A] match closely the frequency of a global reference tone 102 generated by global reference oscillator 66...." (Column 8, line 66, to column 9, line 2.) "For most reliable operation, *global reference tone 102 is in the middle of the bandwidth occupied by unstable IF reference tone 100.* ... In Fig. 5A the bandwidth of IF reference tone 100 is below the bandwidth of IF signal 94 and centers around the frequency of global reference tone 102 equal to *8.0 MHz.*" (Column 9, lines 6-15; emphasis supplied.) In another embodiment, the global reference tone 102 is *3.125 MHz.* (Column 10, lines 3-7.)

On the other hand, Rudow provides a "golf course yardage and information system" employing a differential Global Positioning System (DGPS). (Column 2, lines 62-64.) According to Rudow, a course management station and multiple golf-cart-based units receive GPS data. (Column 7, lines 31-35.) This information is employed by a GPS subsystem 42 (shown in Fig. 3) to provide a *pulse per second (PPS) signal.* (Column 9, lines 35-39.) The PPS signal is utilized to calibrate at the rate of *once per second* a numerical scale factor associated with a periodic computer interrupt occurring *2048 times per second.* (See Figs. 5A-5D; column 9, lines 35-39 (emphasis supplied); and column 13, line 43, to column 14, line 48.)

As a result, the extremely low frequencies of either the timing signal or the interrupts of Rudow are simply incompatible for use with the Georges system, which operates at much higher frequencies. In other words, if the PPS signal of Rudow is employed as a global reference tone for Georges, the Georges system will not operate properly. Thus, Georges teaches away from the use of the timing signal employed by Rudow.

Further, even if the Rudow and Georges systems were compatible, no motivation exists to combine the references. At its base, Georges provides RF distribution of fixed wireless local loop service, while Rudow teaches a golf course yardage and information system. Each of these references thus involves vastly different classifications and fields of search within the Office, as can be seen on the first page of each of the patents.

Further, the PPS signal of Rudow is utilized to ensure *interrupts* generated internally by the computer of that system occur 2048 times per second, and thus is not employed to help generate a continuously stabilized oscillator signal, as provided for in claim 8, as only a series of internal interrupts are generated, *not* an oscillator signal.

Thus, in light of the foregoing, the Assignee respectfully asserts that Rudow does not provide a global positioning system based timing signal usable to generate a continuously stabilized oscillator signal, that no motivation exists to combine Georges and Rudow due to the widely different areas of art they occupy, and that Georges and Rudow are not combinable due to the incompatibility of the Rudow PPS signal with the Georges system. Thus, the Assignee contends that claim 8 is allowable in view of Georges and Rudow, and such indication is respectfully requested.

Claim 9 depends from independent claim 8, and thus incorporates the provisions of claim 8. Therefore, the Assignee asserts that claim 9 is allowable for at least the same reasons provided above in support of claim 8, and such indication is respectfully requested.

Further, the Office action relies upon the combination of Georges and Rudow, among others, in rejecting claims 1, 3-5, 14, 16-21, 23, 28, 30-32, 35-38, 40, 41, 44, 45, 48, 49, 54-60, 64 and 66. (Pages 6 and 7 of the final Office action.) Thus, the Assignee contends that these claims are allowable as well in view Georges and Rudow, and such indication is respectfully requested.

Claim Rejections Based Upon a Combination of Csapo and Rudow

Claims 1, 3-5, 8, 9, 14-17, 22, 23, 26, 28, 29, 31, 35-38, 40, 45-50, 52, 54, 56-60, 62 and 67 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,411,825 to Csapo et al. (hereinafter "Csapo") in view of Rudow. (Page 8 of the final Office action.)

Claims 30, 32, 41, 44, 55, 64 and 66 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Csapo in view of Rudow and Quayle. (Page 11 of the final Office action.)

Claims 11-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Csapo in view of Rudow, Quayle, and U.S. Patent No. 6,194,970 to Nielsen et al. (hereinafter "Nielsen"). (Page 12 of the final Office action.)

Claims 33 and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Csapo in view of Rudow and U.S. Patent No. 6,161,024 to Komara (hereinafter "Komara"). (Page 13 of the final Office action.)

Regarding claims 8, 35 and 57, the final Office action indicates that "Csapo fails to disclose the GPS 'stable' timing signal is used to generate a 'stable' oscillator signal. However, Rudow discloses a system wherein a base station and carts use the GPS 'stable' signal *to*

recalibrate clock errors of the oscillators caused by temperature drift, for improving stability of the oscillators in order to obtain a good synchronization (see Fig. 1, col. 6, lines 53-56, col. 7, lines 30-35, col. 9, lines 35-37, col. 14, lines 31-48 and col. 35, lines 57-63). Since Csapo further discloses that the GPS provides 'accurate clock' and 'frequency signals' to the main unit PMU and the remote unit PRU (see Csapo, col. 7, lines 22-27), it would have been obvious…to provide the above teachings of Rudow to Csapo for using the GPS timing (or 'accurate clock') signal *to recalibrate clock errors of the oscillators of the PMU and of the PRU* as well, thereby resulting in generating a 'stabilized' oscillator signal as claimed, for improving the stability of the oscillators." (Page 10 of the final Office action; emphasis supplied.) The Assignee respectfully disagrees with the allegation in at least two respects.

First, while Csapo discusses the existence of "a global positioning receiver 140 which provides accurate clock and frequency signals" to various portions of the Csapo system (column 7, lines 22-26), Csapo does not teach or suggest a *stabilized local oscillator* configured to receive a *stable timing signal* for generating a *continuously stabilized oscillator signal comprising a frequency that does not drift*, as provided in claims 8, 35 and 57. According to the language of Csapo, the global positioning receiver 140 provides accurate clock and frequency signals directly to the various portions of the Csapo system, and not to a local oscillator to generate a stabilized oscillator signal, as alleged in the final Office action.

Further, as described above, the pulse-per-second (PPS) signal of Rudow is employed to calibrate a scale factor correction so that a computer may internally generate 2048 interrupts per second. Such a signal is not appropriate as a timing signal for receipt by a stabilized local oscillator to generate a continuously stabilized oscillator signal, as provided in claims 8, 35 and 57.

As a result, no combination of Csapo and Rudow supplies the required structure concerning the local oscillator, and its associated stable timing signal and continuously stabilized oscillator signal, as provided for in claims 8, 35 and 57. Thus, the Assignee asserts that claims 8, 35 and 57 are allowable in view of Csapo and Rudow for at least these reasons, and such indication is respectfully requested.

Further, the final Office action relies on the combination of Csapo and Rudow, among others, in rejecting claims 1, 3-5, 9, 11-13, 14-17, 22, 23, 26, 28, 29, 30-34, 36-38, 40, 41, 44-50, 52, 54-56, 58-60, 62, 64, 66 and 67. Thus, the Assignee asserts that these claims are allowable

for at least the same reasons provided above with respect to claims 8, 35 and 57, and such indication is respectfully requested.

Claim Rejections Based Upon a Combination of Csapo, Nielsen and Bickley

Claims 1, 3-5, 8, 9, 14-17, 22, 23, 26-29, 31, 35-38, 40, 45-50, 52-54, 56-60, 62, 67 and 68 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Csapo in view of Nielsen and U.S. Patent No. 5,982,322 to Bickley et al. (hereinafter "Bickley"). (Page 14 of the final Office action.)

Claims 33 and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Csapo in view of Nielsen, Bickley and Komara. (Page 18 of the final Office action.)

Claims 11-13, 30, 32, 41, 44, 55, 64 and 66 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Csapo in view of Nielsen, Bickley and Quayle. (Page 18 of the final Office action.)

Again regarding claims 8, 35 and 57, the final Office action indicates that "Csapo fails to disclose the GPS 'stable' timing signal is used to generate a 'stable' oscillator signal. However, it is noted that since Csapo discloses that the GPS provides 'accurate clock' and 'frequency signals' to the main unit and the remote unit (PRU) (see Csapo, col. 7, lines 22-27), it would have been obvious...that such GPS 'stable' timing signal would obviously be used as common time (or system timing reference) for the base station *to compensate or periodically calibrate the timing reference of the oscillator as disclosed by Nielsen* (see col. 3, lines 5-15, col. 4, lines 1-7 and col. 4, lines 50-56)." (Pages 15 and 16 of the final Office action; emphasis supplied.) The final Office action also mentions the possible use of Bickley in the same context. (Page 16 of the final Office action.) Again, the Assignee respectfully disagrees.

As described earlier, Csapo does not specifically mention a *stabilized local oscillator* configured to receive a *stable timing signal* for generating a *continuously stabilized oscillator signal comprising a frequency that does not drift*, as provided in claims 8, 35 and 57. Instead, the global positioning receiver 140 provides accurate clock and frequency signals directly to the various portions of the Csapo system, and not to a local oscillator to generate a continuously stabilized oscillator signal, as alleged in the final Office action.

Nielsen provides "a method and apparatus to perform holdover testing of an oscillator in service." (Column 2, lines 10 and 11.) More specifically, a GPS receiver 102 or a redundant

GPS receiver 103, comprising part of a main clock generator 110 and a redundant clock generator 111, respectively, generates a timing signal used for a main clock signal of a Code Division Multiple Access (CDMA) base station, as shown in Fig. 1. (Column 3, lines 44-49.) "Each GPS receiver is connected to a controller 104 or 105 that changes the clock signal source from the GPS receiver to an oven-controlled crystal oscillator 106 or 107 during holdover periods." (Column 3, lines 49-52.) In other words, while the GPS signal is being received by either clock generator 110, 111, the system clock signal is provided directly by one of the GPS receivers 102, 103. Else, if the GPS signal is lost, "the crystal oscillator of either the main or redundant clock generator provide[s] the system clock signal." (Column 4, lines 4-11.) While the GPS signal is being received, the GPS timing signal is being used to *characterize* the stability of the crystal oscillator so that when the oscillator is used as a result of a lost GPS signal, the *previous* characterization is used to properly control the oscillator. (Column 4, lines 12-27.) Thus, Nielsen uses a GPS-based timing signal directly as a main clock signal, and as a means for *characterizing* an oscillator for *later control* of the oscillator when the GPS signal is not being received. As a result, Nielsen does *not* teach or suggest using a timing signal as an input to a local oscillator to generate a continuously stabilized oscillator signal, as provided for in claims 8, 35 and 57.

In general, Bickley discloses a "mobile position locating radio" employing "a geolocation receiver," such as a GPS receiver, "for providing local position and timing information." (Column 2, lines 24-30.) Utilized within the radio is "a stable master oscillator which is in turn *calibrated* by accurate timing or frequency signals from [a real time] clock 41 and GPS receiver 34 via data processor 38." (Column 8, lines 4-7; emphasis supplied.) "Real time clock 41 is conveniently slaved, i.e. *calibrated or corrected*, using high accuracy time/frequency information obtained by geolocation receiver 34…." (Column 5, lines 34-39.) Further, as shown in Fig. 2, "[d]ata processor 38 is coupled to real time clock 41 by bus 42." (Fig. 2; and column 5, lines 31 and 32.) Thus, Bickley describes a *numerical clock* 41 (as it is coupled via a bus 42 to a data processor 38) *periodically calibrated or corrected* via a GPS signal, not an *oscillator stabilized* by a GPS-based timing signal, as provided for in the independent claims.

Thus, in light of the discussion above, the Assignee contends claims 8, 35 and 57 are allowable in view of any combination of Csapo, Nielsen and Bickley, and such indication is respectfully requested.

Further, the final Office action also relies on the combination of Csapo, Nielsen and Bickley in rejecting claims 1, 3-5, 9, 11-17, 22, 23, 26-29, 30-34, 36-38, 40, 41, 44-50, 52-56, 58-60, 62, 64, 66 and 67. (Pages 14-19 of the final Office action.) Thus, the Assignee asserts these claims are allowable in view of any combination of Csapo, Nielsen and Bickley for at least the same reasons as those provided in support of claims 8, 35 and 57, and such indication is respectfully requested.

Claim Rejections Based Upon a Combination of Csapo and Gehrke

Claims 1, 3-5, 8, 9, 14-17, 22, 23, 26, 28, 29, 31, 35-38, 40, 45-50, 52, 54, 56-60, 62 and 67 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Csapo in view of U.S. Patent No. 6,185,429 to Gehrke et al. (hereinafter "Gehrke"). (Page 19 of the final Office action.)

Claims 30, 32, 41, 44, 55 and 64 and 66 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Csapo in view of Gehrke and Quayle. (Page 23 of the final Office action.)

Finally, claims 11-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Csapo in view of Gehrke, Quayle and Nielsen. (Page 24 of the final Office action.)

Further with respect to claims 8, 35 and 57, the final Office action states that "Csapo fails to disclose the GPS 'stable' timing signal is used to generate a 'stable' oscillator signal. However, Gehrke discloses a base station wherein the GPS 'stable' timing signal is used to periodically correct errors of the oscillators, for improving stability of oscillators in order to provide good synchronization system (see Fig. 2, ref. 208 and col. 4, lines 13-19, col. 2, lines 9-24). Since Csapo further discloses that the GPS provides 'accurate clock' and 'frequency signals' to the main unit PMU and the remote unit PRU (see Csapo, col. 7, lines 22-27), it would have been obvious...to provide the above teachings of Gehrke to Csapo for using the GPS timing (or 'accurate clock') signal *to recalibrate clock errors of the oscillators of the PMU and of the PRU* as well, thereby resulting in generating a 'stabilized' oscillator signal as claimed, for improving the stability of the oscillators." (Pages 21 and 22 of the final Office action; emphasis supplied.) The Assignee respectfully disagrees.

As discussed above, Csapo does not specifically mention a *stabilized local oscillator* configured to receive a *stable timing signal* for generating a continuously stabilized oscillator signal, as provided in claims 8, 35 and 57. Instead, the global positioning receiver 140 provides

accurate clock and frequency signals directly to the various portions of the Csapo system, and not to a local oscillator to generate a stabilized oscillator signal, as alleged in the final Office action.

Gehrke provides "a method and apparatus for performing a time synchronization of a base site" of a radio communication system. (Column 2, lines 61-63.) The system includes a GPS receiver 210 coupled to a timing reference unit 208. (Column 3, lines 49-52.) The GPS receiver 210 has access to a GPS satellite signal as a *common time base* for synchronizing the timing reference unit 208. (Column 4, lines 13-19; emphasis supplied.) "Once a base site is synchronized, it is able to maintain the timing reference by use of a local oscillator. Any lack of stability in the oscillator can be *periodically corrected by resynchronizing with the GPS signal* or through *periodic correction of the oscillator based on known drift in the oscillator performance*." (Column 2, lines 20-25; emphasis supplied.) Thus, Gehrke relies on either (1) periodic resynchronization of a numeric time reference via GPS, of (2) periodic correction of an unstable oscillator based on known drift properties, and hence not by way of GPS. Thus, Gehrke does not teach or suggest *continuous stabilization* of the actual oscillator signal *comprising a frequency that does not drift*, as set forth in claims 8, 35 and 57.

Thus, for at least these reasons, the Assignee asserts that claims 8, 35 and 57 are allowable in view of any combination of Csapo and Gehrke, and such indication is respectfully requested.

Further, the final Office action employs the combination of Csapo and Gehrke in rejecting claims 1, 3-5, 9, 11-17, 22, 23, 26, 28-32, 36-38, 40, 41, 44-50, 52, 54-56, 58-60, 62, 64, 66 and 67. (Pages 19-24 of the final Office action.) Thus, the Assignee asserts that these claims are allowable for at least the same reasons provided above in support of claims 8, 35 and 57, and such indication is respectfully requested.

Therefore, based on the foregoing, the Assignee respectfully requests withdrawal of the 35 U.S.C. § 103 rejections of claims 1, 3-5, 8, 9, 11-23, 26-38, 40, 41, 44-50, 52-60, 62, 64, and 66-68.

<u>Conclusion</u>

Based on the above remarks, the Assignee submits that claims 1, 3-5, 8, 9, 11-23, 26-38,

40, 41, 44-50, 52-60, 62, 64, and 66-68 are allowable. Additional reasons in support of patentability exist, but such reasons are omitted in the interests of clarity and brevity. The Assignee thus respectfully requests allowance of claims 1, 3-5, 8, 9, 11-23, 26-38, 40, 41, 44-50, 52-60, 62, 64, and 66-68.

The Assignee hereby authorizes the Office to charge Deposit Account No. 21-0765 the appropriate amounts for the request for continued examination (37 C.F.R. § 1.17(e)) and for the request for a one-month extension of time (37 C.F.R. § 1.17(a)(1)). The Assignee believes no additional fees are due with respect to this filing. However, should the Office determine additional fees are necessary, the Office is hereby authorized to charge Deposit Account No. 21-0765.

Respectfully submitted,

Date: 5/18/06

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